WHAT IS CLAIMED IS:

1. An optical pick-up comprising:

a first semiconductor laser light source for emitting a light beam with wavelength $\lambda 1$;

a second semiconductor laser light source for emitting a light beam with wavelength $\lambda 2$;

a converging optical system for receiving the light beams emitted from the first and second semiconductor laser light sources and for converging the received light beams into a microscopic spot on an optical disk;

a diffractive element for diffracting the light beam reflected by the optical disk; and

a photo detecting portion for receiving the diffracted light diffracted by the diffractive element and for outputting an electric signal proportional to the amount of the diffracted light,

wherein the photo detecting portion comprises a photo detecting portion PD0 for receiving a +first order diffracted light from the diffractive element, and wherein a distance d1 between the center of the photo detecting portion PD0 and the light emitting spot of the first semiconductor laser light source and a distance d2 between the center of the photo detecting portion PD0 and the light emitting spot of the second semiconductor laser light source substantially satisfy the following relationship:

$$\lambda 1/\lambda 2 = d1/d2.$$

2. An optical pick-up, comprising:

a first semiconductor laser light source for emitting a light beam with wavelength $\lambda 1$;

a second semiconductor laser light source for emitting a light beam with wavelength $\lambda 2$;

a converging optical system for receiving the light beams emitted from the first and second semiconductor laser light sources and for converging the received light beams into a microscopic spot on an optical disk;

a diffractive element for diffracting the light beam reflected by the optical disk; and

a photo detecting portion for receiving the diffracted light diffracted by the diffractive element and for outputting an electric signal proportional to the amount of the diffracted light,

wherein the photo detecting means comprises a photo detecting portion PD0 for receiving a +first order diffracted light from the diffractive element, and a distance d1 between the center of the photo detecting portion PD0 and the light emitting spot of the first semiconductor laser light source and a distance d2 between the center of the photo detecting portion PD0 and the light emitting spot of the second semiconductor laser light source, and a distance d12 between the light emitting spots of the first and second semiconductor laser light sources satisfy the following relationship:

$$d2 = d1 + d12$$

and substantially satisfy the following relationships:

$$d1 = \lambda 1 \cdot d12/(\lambda 2 - \lambda 1)$$

$$d2 = \lambda 2 \cdot d12/(\lambda 2 - \lambda 1).$$

3. An optical pick-up comprising:

a first semiconductor laser light source for emitting a light beam with wavelength $\lambda 1$;

a second semiconductor laser light source for emitting a light beam with wavelength $\lambda 2$;

a converging optical system for receiving the light beams emitted from the first and second semiconductor laser light sources and for converging the received light beam into a microscopic spot on an optical disk;

a diffractive element for diffracting a light beam reflected by the optical disk; and

a photo detecting portion for receiving the diffracted light diffracted by the diffractive element and for outputting an electric signal proportional to the amount of the diffracted light,

wherein the photo detecting portion comprises a photo detecting portion PD1 for receiving a −first order diffracted light of the light beam with wavelength $\lambda 1$ in the diffracted light diffracted by the diffractive element, and a photo detecting portion PD2 for receiving a −first order diffracted light of the light beam with wavelength $\lambda 2$ in the diffracted light diffracted by the diffractive element, and the photo detecting portion PD1 and the photo detecting portion PD2 are divided into a plurality of regions respectively, and

wherein when information reproduction is carried out by the use of the light with wavelength $\lambda 1$, signals obtained from the regions of the photo detecting portion PD1 are calculated to detect a focus error signal, and when the information reproduction is carried out by the use of the light with

wavelength $\lambda 2$, signals obtained from the regions of the photo detecting portion PD2 are calculated to detect a focus error signal.

4. The optical pick-up according to claim 3, wherein the shape of the photo detecting portion PD1 is different from the shape of the photo detecting portion PD2.

5. The optical pick-up according to claim 3, wherein the photo detecting portion PD1 and the photo detecting portion PD2 are divided into a plurality of regions by dividing lines, and a symmetrical central line parallel to the dividing line of the photo detecting portion PD2 and a symmetrical central line parallel to the dividing line of the photo detecting portion PD1 are deviated from each other in the direction perpendicular to each symmetrical central line.

6. The optical pick-up according to claim 3, wherein the first semiconductor laser light source and the second semiconductor laser light source are formed monolithically on one semiconductor chip.

7. The optical pick-up according to claim 3, further comprising a grating that forms a main beam and a sub-beam that is a $\pm$first order diffracted light by receiving a light beam with wavelength $\lambda 2$ emitted from the second semiconductor laser light source when the wavelength $\lambda 1$ is set to be in the range from 610 nm to 670 nm, and the wavelength $\lambda 2$ is set to be in the range from 740 nm to 830 nm,

wherein a grating cross-sectional shape of the grating is substantially rectangular having concave and convex portions, the width of the concave portion and the width of the convex portion are substantially the same, and a level difference h between the concave portion and the convex portion of the cross sectional shape is represented by the following relationship when n1 denotes a refractive index of a material of the grating with respect to the wavelength $\lambda 1$:

$$h = \lambda 1 / (n1 - 1), \text{ and}$$

the level difference in an optical path between the concave portion and the convex portion is set to be one wavelength.

8. The optical pick-up according to claim 7, wherein in both of the light

beam with wavelength $\lambda 1$ and the light beam with wavelength $\lambda 2$, a light beam entering an objective lens constituting the converging optical system without being diffracted by the grating, forms grating stripes in the entire range satisfying a NA necessary to the reproduction of the optical disk.

9. The optical pick-up according to claim 3, wherein the wavelength $\lambda 1$ is smaller than the wavelength $\lambda 2$, and the light emitting spot of the first semiconductor laser light source is arranged substantially on the optical axis of the converging optical system.

10. The optical pick-up according to claim 3, wherein the diffractive element has a focus error offset reducing region.

11. An optical disk apparatus comprising an optical pick-up according to claim 3, a moving mechanism for the optical pick-up, and a rotation mechanism for rotating the optical disk.

12. An optical pick-up comprising:

a first semiconductor laser light source for emitting a light beam with wavelength $\lambda 1$;

a second semiconductor laser light source for emitting a light beam with wavelength $\lambda 2$;

a converging optical system for receiving the light beams emitted from the first and second semiconductor laser light sources and for converging the received light beam into a microscopic spot on an optical disk;

a diffractive element for diffracting a light beam reflected by the optical disk; and

a photo detecting portion for receiving the diffracted light diffracted by the diffractive element and for outputting an electric signal proportional to the amount of the diffracted light,

wherein the photo detecting portion comprises a photo detecting portion PD1 for receiving a $-$first order diffracted light of the light beam with wavelength $\lambda 1$ in the diffracted light diffracted by the diffractive element, and a photo detecting portion PD2 for receiving a $-$first order diffracted light of the light beam with wavelength $\lambda 2$ in the diffracted light diffracted by the diffractive element; and a distance d1 between the center of the photo detecting portion PD1 and the light emitting spot of the first semiconductor

laser light source and a distance d2 between the center of the photo detecting portion PD2 and the light emitting spot of the second semiconductor laser light source substantially satisfy the following relationship:

$$\lambda 1/\lambda 2 = d1/d2.$$

13. The optical pick-up according to claim 12, wherein when d12 denotes a distance between the light emitting spot of the first semiconductor laser light source and the light emitting spot of the second semiconductor laser light source, a gap between the center of the photo detecting portion PD1 and the center of the photo detecting portion PD2 is set to be twice d12.

14. The optical pick-up according to claim 12, wherein the photo detecting portion PD1 and the photo detecting portion PD2 are divided into a plurality of regions respectively, and when information reproduction is carried out by the use of the light with wavelength $\lambda 1$, signals obtained from the regions of the photo detecting portion PD1 are calculated to detect a focus error signal, and when the information reproduction is carried out by the use of the light with wavelength $\lambda 2$, signals obtained from the regions of the photo detecting portion PD2 are calculated to detect a focus error signal.

15. The optical pick-up according to claim 14, wherein the shape of the photo detecting portion PD1 is different from the shape of the photo detecting portion PD2.

16. The optical pick-up according to claim 14, wherein the photo detecting portion PD1 and the photo detecting portion PD2 are divided into a plurality of regions by dividing lines, and a symmetrical central line parallel to the dividing line of the photo detecting portion PD2 and a symmetrical central line parallel to the dividing line of the photo detecting portion PD1 are deviated from each other in the direction perpendicular to each symmetrical central line.

17. The optical pick-up according to claim 12, wherein the first semiconductor laser light source and the second semiconductor laser light source are formed monolithically on one semiconductor chip.

18. The optical pick-up according to claim 12, further comprising a grating

that forms a main beam and a sub-beam that is ±first order diffracted light by receiving a light beam with wavelength $\lambda 2$ emitted from the second semiconductor laser light source when the wavelength $\lambda 1$ is set to be in the range from 610 nm to 670 nm, and the wavelength $\lambda 2$ is set to be in the range from 740 nm to 830 nm,

wherein a grating cross-sectional shape of the grating is substantially rectangular having concave and convex portions, the width of the concave portion and the width of the convex portion are substantially the same, and a level difference h between the concave portion and the convex portion of the cross sectional shape is represented by the following relationship when n1 denotes a refractive index of a material of the grating with respect to the wavelength $\lambda 1$:

$h = \lambda 1 / (n1-1)$, and

the level difference in an optical path between the concave portion and the convex portion is set to be one wavelength.

19. The optical pick-up according to claim 18, wherein in both of the light beam with wavelength $\lambda 1$ and the light beam with wavelength $\lambda 2$, a light beam entering an objective lens constituting the converging optical system without being diffracted by the grating, forms grating stripes in the entire range satisfying NA necessary to the reproduction of the optical disk.

20. The optical pick-up according to claim 12, wherein the wavelength $\lambda 1$ is smaller than the wavelength $\lambda 2$, and the light emitting spot of the first semiconductor laser light source is arranged substantially on the optical axis of the converging optical system.

21. The optical pick-up according to claim 12, wherein the diffractive element has a focus error offset reducing region.

22 An optical disk apparatus comprising an optical pick-up according to claim 12, a moving mechanism for the optical pick-up, and a rotation mechanism for rotating the optical disk.

23. An optical pick-up comprising:

a first semiconductor laser light source for emitting a light beam with wavelength $\lambda 1$;

a second semiconductor laser light source for emitting a light beam with wavelength $\lambda 2$;

a converging optical system for receiving the light beams emitted from the first and second semiconductor laser light sources and for converging the received light beam into a microscopic spot on an optical disk;

a diffractive element for diffracting a light beam reflected by the optical disk; and

a photo detecting portion for receiving the diffracted light diffracted by the diffractive element and for outputting an electric signal proportional to the amount of the diffracted light,

wherein the photo detecting portion comprises a photo detecting portion PD1 for receiving a −first order diffracted light of the light beam with wavelength $\lambda 1$ in the diffracted light diffracted by the diffractive element; a photo detecting portion PD2 for receiving a −first order diffracted light of the light beam with wavelength $\lambda 2$ in the diffracted light diffracted by the diffractive element; and a photo detecting portion PD0 for receiving a +first order diffracted light of the light beams with wavelength $\lambda 1$ and wavelength $\lambda 2$.

24. The optical pick-up according to claim 23, wherein when a distance between the center of the photo detecting portion PD0 and the light emitting spot of the first semiconductor laser light source is d1, a distance between the center of the photo detecting portion PD0 and the light emitting spot of the second semiconductor laser light source is d2, and a distance between the light emitting spots of the first and second semiconductor laser light sources is d12,

a distance between the center of the photo detecting portion PD1 and the light emitting spot of the first semiconductor laser light source is d1, and a distance between the center of the photo detecting portion PD2 and the light emitting spot of the second semiconductor laser light source is d2, and

the following relationship is substantially satisfied:

$$\lambda 1/\lambda 2 = d1/d2,$$

further the following relationship is substantially satisfied:

$$d2 = d1 + d12, \text{ and}$$

the following relationships are substantially satisfied:

$$d1 = \lambda 1 \cdot d12/(\lambda 2 - \lambda 1)$$
$$d2 = \lambda 2 \cdot d12/(\lambda 2 - \lambda 1).$$

25. The optical pick-up according to claim 23, wherein the photo detecting portion PD1, the photo detecting portion PD2 and the photo detecting portion PD0 are divided into a plurality of regions respectively, and when information reproduction is carried out by using the light with wavelength $\lambda 1$, signals obtained from the regions of the photo detecting portion PD1 are calculated to detect a focus error signal; when information reproduction is carried out by using the light with wavelength $\lambda 2$, signals obtained from the region of the photo detecting portion PD2 are calculated to detect a focus error signal; and signals obtained from the regions of the photo detecting portion PD0 are calculated to detect a tracking error signal.

26. The optical pick-up according to claim 23, wherein the photo detecting portion PD1, and the photo detecting portion PD2 are divided into a plurality of regions respectively, and when information reproduction is carried out by using the light with wavelength $\lambda 1$, signals obtained from the regions of the photo detecting portion PD1 are calculated to detect a focus error signal; and when information reproduction is carried out by using the light with wavelength $\lambda 2$, signals obtained from the regions of the photo detecting portion PD2 are calculated to detect a focus error signal, and

wherein the shape of the photo detecting portion PD1 is different from the photo detecting portion PD2.

27. The optical pick-up according to claim 23, wherein the photo detecting portion PD1 and the photo detecting portion PD2 are divided into a plurality of regions by dividing lines respectively and when information reproduction is carried out by using the light with wavelength $\lambda 1$, signals obtained from the regions of the photo detecting portion PD1 are calculated to detect a focus error signal; and when information reproduction is carried out by using the light with wavelength $\lambda 2$, signals obtained from the regions of the photo detecting portion PD2 are calculated to detect a focus error signal and,

wherein a symmetrical central line parallel to the dividing line of the photo detecting portion PD2 and a symmetrical central line parallel to the dividing line of the photo detecting portion PD1 are deviated from each other in the direction perpendicular to each symmetrical central line.

28. The optical pick-up according to claim 23, wherein the first

semiconductor laser light source and the second semiconductor laser light source are formed monolithically on one semiconductor chip.

29. The optical pick-up according to claim 23, further comprising a grating that forms a main beam and sub-beams that are ±first order diffracted light by receiving a light beam with wavelength $\lambda 2$ emitted from the second semiconductor laser light source when the wavelength $\lambda 1$ is set to be in the range from 610 nm to 670 nm, and the wavelength $\lambda 2$ is set to be in the range from 740 nm to 830 nm,

wherein a grating cross-sectional shape of the grating is substantially rectangular having concave and convex portions, the width of the concave portion and the width of the convex portion are substantially the same, and the level difference h between the concave portion and the convex portion of the cross sectional shape is represented by the following relationship when n1 denotes a refractive index of a material of the grating with respect to the wavelength $\lambda 1$:

$h = \lambda 1 / (n1 - 1)$, and

the level difference in an optical path between the concave portion and the convex portion is set to be one wavelength.

30. The optical pick-up according to claim 29, wherein in both of the light beam with wavelength $\lambda 1$ and the light beam with wavelength $\lambda 2$, a light beam entering an objective lens constituting the converging optical system without being diffracted by the grating, forms grating stripes in the entire range satisfying NA necessary to the reproduction of the optical disk.

31. The optical pick-up according to claim 23, wherein the wavelength $\lambda 1$ is smaller than the wavelength $\lambda 2$, and the light emitting spot of the first semiconductor laser light source is arranged substantially on the optical axis of the converging optical system.

32. The optical pick-up according to claim 23, wherein the diffractive element has a focus error offset reducing region.

33. An optical disk apparatus comprising an optical pick-up according to claim 23, a moving mechanism for the optical pick-up and a rotation mechanism for rotating the optical disk.

34. An optical pick-up comprising:

a first semiconductor laser light source for emitting a light beam with wavelength $\lambda 1$;

a second semiconductor laser light source for emitting a light beam with wavelength $\lambda 2$;

a converging optical system for receiving the light beams emitted from the first and second semiconductor laser light sources and for converging the received light beam into a microscopic spot on an optical disk;

a diffractive element for diffracting the light beam reflected by the optical disk; and

a photo detecting portion for receiving the diffracted light diffracted by the diffractive element and for outputting an electric signal proportional to the amount of the diffracted light,

wherein the photo detecting portion comprises a photo detecting portion PD1 for receiving the light beam with wavelength $\lambda 1$ in the diffracted light diffracted by the diffractive element; a photo detecting portion PD2 for receiving the light beam with wavelength $\lambda 2$, and a photo detecting portion PD0 for receiving the light beams with wavelength $\lambda 1$ and wavelength $\lambda 2$; and

wherein when information reproduction is carried out by using the light with wavelength $\lambda 1$, signals obtained from the regions of the photo detecting portion PD1 are calculated to detect a focus error signal; when information reproduction is carried out by using the light with wavelength $\lambda 2$, signals obtained from the regions of the photo detecting portion PD2 are calculated to detect a focus error signal; and signals obtained from the regions of the photo detecting portion PD0 are calculated to detect a tracking error signal.

35. An optical disk type recognition method for determining whether an optical disk is present in the optical disk apparatus, and determining whether a disk that is present is CD or DVD, the method comprising:

by using an optical disk apparatus provided with an optical pick-up using an infrared light source and a red light source, determining whether an optical disk is present by emitting the infrared light source first when the power of the optical disk apparatus is turned on, or when an optical disk is inserted into the apparatus, and

determining the kinds of the optical disk by using the reflected light from the optical disk when the optical disk is present.

36. An optical disk recording and reproducing method, comprising:

recording or reproducing information by continuing to allow the infrared light to be emitted when the inserted optical disk is judged to be CD by the determination of the optical disk by the use of the optical disk type recognition method according to claim 35, and

recording or reproducing information on DVD by extinguishing the infrared light and turning on the red light when the inserted disk is judged to be DVD by the determination of the optical disk by the use of the optical disk type recognition method according to claim 35.

37. An information processing apparatus, comprising:

an optical disk apparatus for recording or reproducing information on an optical disk, or for reproducing and for reproducing information on an optical disk, and

an image information read-out means for reading out an image information on a manuscript,

wherein the image information read out by the information read-out means can be recorded on the optical disk apparatus.

38. The information processing apparatus according to claim 37, further comprising an information copying means capable of at least one of copying of image information read out by the image reading means by the use of the copying means, and copying of the image information recorded on the optical disk apparatus by the used of the copying means.

39. An image projection apparatus, comprising a projecting means for projecting an image onto a front glass of a car.

40. The image projection apparatus according to claim 39, further comprising an optical disk apparatus for recording or reproducing information on the optical disk, or an optical disk apparatus for recording and reproducing information, wherein the information reproduced from the optical disk apparatus is projected onto the front glass.

41. The image projecting apparatus according to claim 40, further comprising a converting circuit for converting the information reproduced by the optical disk apparatus into an image adjusted to the curvature of the front glass, wherein the information output from the converting circuit is projected onto the front glass.

42. A semiconductor laser apparatus, comprising

a first semiconductor laser light source for emitting a light beam with wavelength $\lambda 1$;

a second semiconductor laser light source for emitting a light beam with wavelength $\lambda 2$; and

a photo detecting portion for receiving the light beam and for outputting a signal proportional to the amount of the diffracted light,

wherein a distance d1 between the center of the photo detecting portion PD0 and the light emitting spot of the first semiconductor laser light source and a distance d2 between the center of the photo detecting portion PD0 and the light emitting spot of the second semiconductor laser light source substantially satisfy the following relationship:

$$\lambda 1/\lambda 2 = d1/d2.$$

43. The semiconductor laser apparatus according to claim 42, wherein the first semiconductor laser light source and the second semiconductor laser light source are formed monolithically on one semiconductor chip.

44 The semiconductor laser apparatus according to claim 42, wherein the photo detecting portion comprises a photo detecting portion PD1 for receiving light with wavelength $\lambda 1$ and a photo detecting portion PD2 for receiving light with wavelength $\lambda 2$, and the photo detecting portion PD1 and the photo detecting portion PD2 are divided into a plurality of regions and the shape of the photo detecting portion PD1 is different from the shape of the photo detecting portion PD2.

45. The semiconductor laser apparatus according to claim 42, wherein the photo detecting portion comprises a photo detecting portion PD1 for receiving the light with wavelength $\lambda 1$ and a photo detecting portion PD2 for receiving the light with $\lambda 2$, and

wherein the photo detecting portion PD1 and the photo detecting

portion PD2 are divided into a plurality of regions by dividing lines, and a symmetrical central line parallel to the dividing line of the photo detecting portion PD2 and a symmetrical central line parallel to the dividing line of the photo detecting portion PD1 are deviated from each other in the direction perpendicular to each symmetrical central line.

46. A semiconductor laser apparatus comprising:

a first semiconductor laser light source for emitting a light beam with wavelength $\lambda 1$;

a second semiconductor laser light source for emitting a light beam with wavelength $\lambda 2$; and

a photo detecting portion for receiving the diffracted light diffracted by the diffractive element and for outputting a signal proportional to the amount of the diffracted light,

wherein a distance d1 between the center of the photo detecting portion PD0 and the light emitting spot of the first semiconductor laser light source, a distance d2 between the center of the photo detecting portion PD0 and the light emitting spot of the second semiconductor laser light source, and the distance d12 between the light emitting spots of the first and second semiconductor laser light sources satisfy the following relationship:

$$d2 = d1 + d12$$

and substantially satisfy the following relationships:

$$d1 = \lambda 1 \cdot d12/(\lambda 2 - \lambda 1)$$

$$d2 = \lambda 2 \cdot d12/(\lambda 2 - \lambda 1).$$

47. The semiconductor laser apparatus according to claim 46, wherein the first semiconductor laser light source and the second semiconductor laser light source are formed monolithically on one semiconductor chip.

48. The semiconductor laser apparatus according to claim 46, wherein the photo detecting portion comprises a photo detecting portion PD1 for receiving a light with wavelength $\lambda 1$ and a photo detecting portion PD2 for receiving a light with wavelength $\lambda 2$, and the photo detecting portion PD1 and the photo detecting portion PD2 are divided into a plurality of regions and the shape of the photo detecting portion PD1 is different from the shape of the photo detecting portion PD2.

49. The semiconductor laser apparatus according to claim 46, wherein the photo detecting portion comprises a photo detecting portion PD1 for receiving the light with wavelength $\lambda 1$ and a photo detecting portion PD2 for receiving the light with $\lambda 2$, and wherein the photo detecting portion PD1 and the photo detecting portion PD2 are divided into a plurality of regions by dividing lines, and a symmetrical central line parallel to the dividing line of the photo detecting portion PD2 and a symmetrical central line parallel to the dividing line of the photo detecting portion PD1 are deviated from each other in the direction perpendicular to each symmetrical central line.

50. A semiconductor laser apparatus comprising:

a first semiconductor laser light source for emitting a light beam with wavelength $\lambda 1$;

a second semiconductor laser light source for emitting a light beam with wavelength $\lambda 2$; and

a photo detecting portion for receiving the diffracted light diffracted by the diffractive element and for outputting a signal proportional to the amount of the diffracted light,

wherein the photo detecting portion comprises a photo detecting portion PD1 for receiving a light beam with wavelength $\lambda 1$, and a photo detecting portion PD2 for receiving a light beam with wavelength $\lambda 2$; and a distance d1 between the center of the photo detecting portion PD1 and the light emitting spot of the first semiconductor laser light source and a distance d2 between the center of the photo detecting portion PD2 and the light emitting spot of the second semiconductor laser light source substantially satisfy the following relationship:

$\lambda 1/\lambda 2 = d1/d2$.

51. The semiconductor laser apparatus according to claim 50, wherein at least one of the photo detecting portion PD1 and the photo detecting portion PD2 is divided into any one of five strip-shaped regions, four strip-shaped regions and six strip-shaped regions.

52. The semiconductor laser apparatus according to claim 50, wherein the first semiconductor laser light source and the second semiconductor laser light source are formed monolithically on one semiconductor chip.

53. The semiconductor laser apparatus according to claim 50, wherein the photo detecting portion PD1 and the photo detecting portion PD2 are divided into a plurality of regions, and wherein the shape of the photo detecting portion PD1 is different from the shape of the photo detecting portion PD2.

54. The semiconductor laser apparatus according to claim 50, wherein the photo detecting portion PD1 and the photo detecting portion PD2 are divided into a plurality of regions by a dividing line, and a symmetrical central line parallel to the dividing line of the photo detecting portion PD2 and a symmetrical central line parallel to the dividing line of the photo detecting portion PD1 are deviated from each other in the direction perpendicular to each symmetrical central line.

55. A semiconductor laser apparatus, comprising:

a first semiconductor laser light source for emitting a light beam with wavelength $\lambda 1$;

a second semiconductor laser light source for emitting a light beam with wavelength $\lambda 2$; and

a photo detecting portion for receiving the diffracted light diffracted by the diffractive element and for outputting an electric signal proportional to the amount of the diffracted light,

wherein the photo detecting portion comprises a photo detecting portion PD1 for receiving a light beam with wavelength $\lambda 1$, a photo detecting portion PD2 for receiving a light beam with wavelength $\lambda 2$; and a photo detecting portion PD0 for receiving both lights with wavelength $\lambda 1$ and wavelength $\lambda 2$,

wherein when a distance between the center of the photo detecting portion PD0 and the light emitting spot of the first semiconductor laser light source is d1, a distance between the center of the photo detecting portion PD0 and the light emitting spot of the second semiconductor laser light source is d2, and a distance between the light emitting spots of the first and second semiconductor laser light sources is d12,

a distance between the center of the photo detecting portion PD1 and the light emitting spot of the first semiconductor laser light source is d1, and a distance between the center of the photo detecting portion PD2 and the light emitting spot of the second semiconductor laser light source is d2,

the following relationship is substantially satisfied:

$$\lambda 1/\lambda 2 = d1/d2,$$

further the following relationship is substantially satisfied:

$$d2 = d1 + d12, \text{ and}$$

the following relationships are substantially satisfied:

$$d1 = \lambda 1 \cdot d12/(\lambda 2 - \lambda 1)$$

$$d2 = \lambda 2 \cdot d12/(\lambda 2 - \lambda 1).$$

56. The semiconductor laser apparatus according to claim 55, wherein the first semiconductor laser light source and the second semiconductor laser light source are formed monolithically on one semiconductor chip.

57. The semiconductor laser apparatus according to claim 55, wherein the photo detecting portion PD1 and the photo detecting portion PD2 are divided into a plurality of regions respectively, and the shape of the photo detecting portion PD1 is different from the shape of the photo detecting portion PD2.

58. The semiconductor laser apparatus according to claim 55, wherein the photo detecting portion PD1 and the photo detecting portion PD2 are divided into a plurality of regions by a dividing line, and a symmetrical central line parallel to the dividing line of the photo detecting portion PD2 and a symmetrical central line parallel to the dividing line of the photo detecting portion PD1 are deviated from each other in the direction perpendicular to each symmetrical central line.